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Imidazolium-Based Ionic Liquids Containing the Trifluoroacetate Anion: Thermodynamic Study

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Abstract New experimental vapor pressures and vaporization enthalpies of the ionic liquids $[C_2mim][CF_3CO_2]$ and $[C_4mim][CF_3CO_2]$ have been measured by the QCM method. The solution enthalpies of these ionic liquids were measured by using high-precision solution calorimetry and were used for calculation the aqueous enthalpy of formation $\Delta_f H^\circ_m(CF_3CO_2^-, aq)$ of the anion for combination with quantum-chemical results. The solubility parameters of the ILs under study have been derived from experimental $\Delta^g_l H^\circ_m(298.15\ K)$ values and were used for estimation of miscibility of some common solutes with $[C_n mim][CF_3CO_2]$.

Keywords Ionic liquid · Enthalpy of vaporization · Enthalpy of solution · Vapor pressure · Enthalpy of formation

1 Introduction

At the present, applications of ionic liquids (ILs) as neoteric solvents are frequently reported in many fields of chemical technology. The successful use of ILs is mostly due to their thermal stability and vanishingly small vapor pressure at ambient temperatures. The virtual absence of the vapor pressure even at elevated temperatures makes ILs ideal solvents for numerous chemical reactions (you only need to remove the reaction products

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